Clause 77.—We must again state that we think this clause requires some restriction relative to the non-payment of fees to the district surveyor, in case work is not in all respects according to Act. We are convinced that the worthless part of the building class will evade the Act, continue to let the time for remedy elapse, and then evade payment of the fees. The parties who evade the fees are always those who cause the district surveyor most trouble; some of the inferior class of builders are desperate characters; we know a case in which the offender stood pistol in hand, and threatened to shoot the district surveyor if he did not go away.

The 78th clause, relating to the district surveyors' return, is still defective and contradictory: first, it is to contain an account of *all* works executed within the previous month; secondly, it is to be deemed to be a certificate that all the works enumerated therein have been done in *all* respects lawfully; and thirdly, it is not to protect offenders from proceedings for matters done before making such return. Thus the surveyor is literally to return works improperly done, and then an indemnity is provided for enabling prosecution.

We repeat Mr. Bartholomew's suggestion, that the return *"be deemed to be a certificate of all works enumerated therein, done in all respects agreeably to this Act,* and of such works as have been done contrary thereto, and of the proceedings which have been taken thereon."

Clause 78.—We must again urge the utter impossibility of two official referees performing the multitudinous offices proposed to be thrown upon them; we are convinced that if power to appoint more be not reserved, a new statute must be made.

In clause 89 the words should for clearness run, "he is hereby required to report to the said commission the matter and the particular grounds and reasons for his refusal."

ROYAL INSTITUTION.

May 31.—Professor Daubeny gave a lecture "On the Provisions for the Subsistence of Living Beings evinced in the Structure of the older Rocks, and in the phenomena which they exhibit."—He began by observing, that as the attention of philosophers was that evening directed to the moon by the eclipse, he thought it might not be inappropriate to illustrate the side of his argument by reference to the supposed structure and condition of that satellite. Supposing then a human being to be transported to the surface of the moon, and to contemplate her in that condition in which astronomers represent her to us as existing —namely, as destitute both of seas and of an atmosphere, with vast cup-shaped mountains, the craters of volcanos, vomiting forth steam and smoke, and emitting streams of melted lava, could he not conceive the globe in question abandoned to those destructive agencies which we saw in such intense activity, rather than that it was in a state of preparation for the abode of beings constituted like himself? Yet what the moon now is, geology leads us to infer that the earth has formerly been; and from the phenomena now presented to us by it, we may infer a train of events to have occurred which, whilst they must have been at the time utterly destructive to all kinds of life, nevertheless prepared the earth for the reception of living beings, and rendered it a more agreeable abode to those which, like man, possessed a feeling of the sublime and beautiful. The Professor then proceeded to point out the provisions for the future existence of living beings which were made in those earlier stages of the history of our globe, when it appears to have been in a condition as chaotic as that of the moon at present. These ingredients of the crust of the earth which seem designed more especially for the purposes of living beings may be distinguished into such as minister to some object of utility for man in particular, and such as are essential to animals and vegetables in general. The former class, being commonly more or less poisonous, occurs in some for the most part existing in the older rocks, being stored, as it were, out of the way, before living beings were created. Such are copper, tin, lead, mercury, and other of the metals. The latter, on the contrary, are more generally diffused through the strata of the globe, although, for the most part, in comparatively minute proportions. Amongst the latter are the fixed alkalies, which are present in all felspathic and other rocks of igneous origin, from which they are slowly disengaged by the action of air and water, in proportion as they are required for the necessities of living beings; whereas if they had been present in a readily soluble form in the earth, they would have been washed into the sea before they could have been made available for such purposes. Another essential ingredient in the structure of animals is phosphoric acid, which appears peculiarly suited for entering into the organization of a living body, by the readiness with which it undergoes changes in its properties, by the character of its crystallization, and (in the case of the bone-earth phosphate) by the association of the *tribasic* with the *tribasic* salt, in equal proportions, which causes each to counteract the tendency to crystallise in the other, and thus renders it more capable of accommodating itself to the delicate texture of the animal fibre. The question then is, whence do animals and vegetables obtain this necessary ingredient? Professor Daubeny and others have detected minute proportions of it in many of the secondary rocks, but as these are derived from more ancient ones, it ought to be present likewise in them. Now we know at least of one instance in which this material occurs in considerable abundance in a rock which, so far as our observations at present extend, seems to have been formed antecedently to animal life. This is the slate rock of Estremadura, in Spain, where, near the village of Logrosan, it had been pointed out as existing many years ago. Exaggerated reports had, however, been spread as to its extent, for Professor Daubeny, lo a visit he paid last year to the locality, found that it formed only one solitary vein, generally about ten feet wide, and extending along the surface for about two miles. It also contains a considerable per-centage of fluate of lime, and as this ingredient appears, from recent experiments of the author's, to be almost to be present generally in bones both recent and fossil, it would seem that it was treasured up by nature as one of the requisite materials for the bony skeletons of animals. Provision seems to have been also made for supplying living beings with their volatilizable, as well as with their fixed ingredients. The attraction of all porous and pulverulent bodies for gases may explain the manner in which the latter are brought into contact with the secreting surfaces of plants; but it must be remembered, that of the four elements which together constitute those parts of a living body which are dissipated by heat, oxygen alone can be directly absorbed. Of the three remaining, hydrogen is derived in that of ammonia, and carbon in that of carbonic acid. Now volcanos appear to have been the appointed means of providing both of the two latter in quantities sufficient for the food of living beings, for both ammonia and carbonic acid are received in immense quantities from all volcanos, but the Professor shewed by appealing to the case of Vesuvius and its neighbourhood, as well as to that of other volcanic vents. The production of ammonia in the interior of the earth might, he contended, be readily explained upon the principles of that theory of volcanos which he had for many years adopted, and which was first laid down the great discovery of that metallic bases of the earths and alkalies, which we owe to the genius of Sir Humphrey Davy. Once admit that those substances which we see brought up to the surface, in the shape of lavas and of ejected masses, exist in the interior of the globe, wholly or partially, in an unoxidized condition, and that first sea-water, and afterwards atmospheric air, gradually find access to them through certain crevices, and all the phenomena of a volcanic eruption may be shewn to follow; namely, the intense heat, the escape of muriatic acid, the copious deposits of sulphur, the volumes of carbonic acid, and, lastly, the salts containing ammonia; for if nascent hydrogen, disengaged from water decomposed by meeting with the alkaline metals, were brought in contact with nitrogen under a high pressure, there is every reason to believe that ammonia would be the result. Thus, the very agents of destruction, which seem at first sight to be antagonist forces to every kind of creative energy, have been, in fact, the appointed means of supplying the materials out of which all organized beings are fashioned. But though the materials for our subsistence are thus provided, it does not follow that man is not to exert himself in order to obtain larger supplies than are naturally placed before him. On the contrary, his business is to husband his resources, and to apply them to the best account. Alluding to a late work of Professor Liebig's, he contended that this eminent chemist could not have meant to discourage the preservation of the volatile ingredients of our manure-heaps, whilst insisting on the paramount importance of supplying those which are fixed. It is true that nothing is lost, for the excrementitious matters which are washed into the sea increase the luxuriance of the marine vegetation, which affords food for a larger number of fishes, which again encourage a greater amount of sea-fowl, which finally deposit, what had been originally derived from the depths of the sea, on the islands of the Pacific, as guano. Thus England contrives, by means of her navies, to bring back from the opposite extremity of the globe, the very material which she originally wasted by the defective arrangements of her large towns. This, however, is a very circuitous mode of proceeding, and the true secret of all agricultural improvement is, to apply the means at our disposal, so as to produce a return for the toil expended in the shortest possible space of time.

June 7.—Right Hon. Sturges Bourne, V.P., in the chair.

Mr. Faraday, "On recent Improvements in the Manufacture and Silvering of Mirrors."—Mr. Faraday's subjects were: 1. The manufacture of plate-glass. 2. The *ordinary* mode of silvering mirrors. 3. The *new* method of producing this result, lately invented and patented by Mr. Drayton.—1. Mirrors are made with plate-glass. Mr. Faraday described glass generally as being essentially a combination of silica with an alkaline oxide. The combination, however, presents the character of a solution rather than of a definite chemical compound, only it is difficult to affirm whether it is the silica or the oxide which is the solvent or the body dissolved. From this mutual condition of the ingredients, it follows that their product is held together by very feeble affinities, and hence, as was afterwards shewn, chemical re-agents will act upon these ingredients with a power which they would not have were glass a definite compound. Mr. Faraday noticed, that as glass is not the result of definite proportionals, there are many combinations of materials capable of producing a more or less perfect result. Each manufacturer, therefore, has his own recipe and process which he considers the most valuable secret of his trade. Soda, however, well known in the flint-glass maker, uses the oxides of lead and of sodium, the bottle-glass maker lime (an oxide of calcium), and the plate-glass maker, (in addition to soda), has recourse to arsenic. Mr. Faraday then adverted to the corrosions which take place in the inferior qualities of glass, owing to the feeble affinity with which their ingredients are held together. He stated that from the surface of flint-glass a very thin film of soluble alkali was washed off by the first contact of liquid, leaving a fine lamina of silica, the hard insoluble quality of which protected the surface which it covered. If, however, this crust of silica chanced to be mechanically removed, the whole of the glass became liable to corrosion, as in ancient lachrymatories and other glass vessels. Mr. Faraday illustrated this by the corroded surfaces of two bottles, one obtained from a cellar in Threadneedle-street, where it had probably remained from the period of the great fire of London, another from the wreck of the *Royal George*. A still more striking instance of the instability of glass as a compound was exhibited by fortunations in the interior of a champagne bottle, which had been filled with diluted sulphuric acid. In this case the acid had separated the silica from the inner surface of the glass, and formed a sulphate with its ingredient, lime. The result was, that the bottle became incrusted internally with cones of silica and sulphate of lime, the bases of which, extending from within outwards, had perforated the sides of the bottle so as to cause the escape of the liquor it contained